IN THE CLAIMS

1. (currently amended) A method of producing an optical filter, ~~characterized in that it comprises effecting the following steps on an optical waveguide (10)~~ comprising:

controlling a ~~the~~ varying interior profile of an optical ~~the~~ waveguide, and

forming ~~writing~~ a Bragg grating in the interior profile of the optical waveguide~~(20)~~, ~~using techniques~~ by allowing independent control of a longitudinal variation of the Bragg wavelength and a longitudinal variation of an ~~the~~ exterior profile of the optical waveguide.

2. (currently amended) A method according to claim 1, ~~characterized in that the step of~~ wherein controlling the varying interior profile of the waveguide is effected by melt-drawing.

3. (currently amended) A method according to claim 1 ~~or claim 2, characterized in that it~~ further comprisinges ~~a step of adding to the optical waveguide comprising a written filter a device for commanding or controlling an applied~~ applying a mechanical force to the optical waveguide.

4. (currently amended) A method according to claim 3, ~~characterized in that it comprises a step of~~ further comprising ~~adding to the optical waveguide means adapted to~~ applying a controlled traction to the optical waveguide.

5. (currently amended) A method according to claim 3, ~~characterized in that it comprises a step of~~ further comprising ~~adding to the optical waveguide means adapted to~~ applying a controlled torsion to the optical waveguide.

6. (currently amended) A method according to ~~any one of~~ claims 1 ~~to 5~~, wherein ~~characterized in that the step of~~ controlling the varying interior profile of the optical waveguide further comprises controlling ~~(10) is adapted to control~~ the longitudinal variation of an~~the~~ effective optical index of the optical waveguide.

7. (currently amended) A method according to ~~any one of~~ claims 1 ~~to 6~~, ~~characterized in that the step of~~ wherein controlling the varying interior profile of the optical waveguide is effected under conditions allowing control of the longitudinal variation of an~~the~~ effective optical index of the waveguide~~, the step of controlling the varying interior profile of the waveguide is followed by a step of~~ and further comprising locally correcting the exterior profile of the waveguide~~,~~ and ~~the step of writing the Bragg grating is effected under conditions that~~ enabl~~e~~ing longitudinal control of the Bragg wavelength.

8. (currently amended) A method according to claim 7, ~~characterized in that the step of writing~~ wherein forming the Bragg grating further comprises ~~consists in~~ producing a constant period or linear grating.

9. (currently amended) A method according to claim 7 ~~or claim 8~~, ~~characterized in that the step of~~ wherein locally correcting the exterior profile of the waveguide is effected before ~~the step of writing~~ forming the Bragg grating.

10. (currently amended) A method according to claim 7 ~~or claim 8~~, ~~characterized in that the step of~~ wherein locally correcting the exterior profile of the waveguide is effected after ~~the step of writing~~ forming the Bragg grating.

11. (currently amended) A mMethod according to ~~any one of~~ claims 7~~ to 10~~, ~~characterized in that the correction step consists in~~ wherein locally correcting the exterior profile of the waveguide further comprises removing material from the exterior profile of the waveguide.

12. (currently amended) A mMethod according to ~~any one of~~ claims 7~~ to 10~~, ~~characterized in that the step of~~ wherein correcting the exterior profile comprises ~~consists in~~ adding material to the exterior profile obtained after ~~the step of~~ controlling the varying interior profile of the waveguide.

13. (currently amended) A method according to ~~any one of~~ claims 1~~ to 5~~, ~~characterized in that the step of~~ wherein controlling the varying interior profile of the waveguide comprises ~~is adapted to~~ controlling the ~~required~~ exterior profile of the optical waveguide.

14. (currently amended) A method according to claim 13, ~~characterized in that the step of~~ wherein controlling the varying interior profile of the optical waveguide is effected under conditions enabling control of the longitudinal variation of the exterior profile of the waveguide and the longitudinal variation ~~of the step~~ of the grating is controlled during formation ~~writing~~ of the Bragg grating to enable control of the longitudinal variation of the Bragg wavelength.

15. (currently amended) A method according to ~~any one of~~ claims 7~~ to 14~~, ~~characterized in that the step of writing~~ wherein forming the Bragg grating comprises ~~is~~ adaptinged the Bragg grating to define a variable period.

16. (currently amended) A method according to ~~any one of~~ claims 1~~ to 15~~, ~~characterized in that the steps of~~ wherein controlling the varying interior profile of the

waveguide and ~~writing~~ forming the Bragg grating are adapted to define a longitudinal linear variation of the Bragg wavelength.

17. (currently amended) A method according to ~~any one of~~ claims 1 ~~to 16~~, ~~characterized in that the steps of conforming~~ wherein controlling the exterior profile of the waveguide ~~are adapted to~~ comprises defininge a non-linear variation of the exterior profile.

18. (currently amended) A method according to claim 15, ~~characterized in that the steps of conforming~~ wherein controlling the exterior profile of the waveguide ~~are adapted to define~~ comprises defining an exterior profile whose cross section conforms to the following equation, in which S_0 and p are constants and z defines the longitudinal axis:

$$S(z) = \frac{S_o}{1 + p.z}$$

19. (currently amended) A method according to ~~any one of~~ claims 1 ~~to 18~~, ~~characterized in that it~~ further comprisesing ~~a step of adding to the optical waveguide means for inducing~~ forming a uniform longitudinal variation of the Bragg wavelength along the optical waveguide.

20. (currently amended) A method according to claim 19, ~~characterized in that it consists in~~ further comprising adding ~~to the optical waveguide~~ means adapted to control the temperature along the longitudinal direction of the optical waveguide ~~of the component~~.

21. (currently amended) A method according to claim 19 ~~or claim 20~~, ~~characterized in that it~~ further comprisinges ~~a step of~~ depositing ~~on the exterior surface~~

~~of the waveguide~~ an electrically or thermally conductive material, ~~for example a metallization~~ on the waveguide.

22. (currently amended) A method according to claim 21, ~~characterized in that~~ wherein the thickness of the conductive material is ~~deposit is~~ non-uniformly deposited along the fiber.

23. (currently amended) A method according to claim 22, ~~characterized in that~~ wherein the longitudinal variation of ~~the deposit~~ a thickness of the deposit is inversely proportional to the cross section of the optical-waveguide.

24. (currently amended) A method according to claim 19 ~~or claim 20~~, ~~characterized in that it includes~~ further comprising placing the waveguide in a microfurnace.

25. (currently amended) A method according to ~~any one of~~ claim~~s~~ 1 ~~to 24~~, ~~characterized in that~~ wherein the Bragg grating ~~(20)~~ is ~~written~~ formed after ~~the operation of controlling the~~ varying interior profile of the optical-waveguide.

26. (currently amended) A method according to ~~any one of~~ claim~~s~~ 1 ~~to 25~~, wherein ~~characterized in that~~ the optical waveguide is an optical fiber.

27. (currently amended) A method according to any one of claim~~s~~ 1 ~~to 26~~, ~~characterized in that~~ wherein the optical waveguide is an optical fiber ~~in which three regions may be distinguished:~~ that includes a doped core, a doped inner cladding, and silica outer cladding.

28. (cancelled)

29. (currently amended) A method according to ~~any one of~~ claim~~s~~ 1 ~~to 28~~, ~~characterized in that the step of writing~~ wherein forming the Bragg grating includes controlling

the modulation amplitude of an ~~the~~ index of the optical waveguide~~during writing~~.

30. (currently amended) A method according to claim 29, wherein ~~characterized in that~~ the modulation amplitude is progressively reduced at the edges of the grating to apodize the spectral response.

31. (currently amended) A method according to claim 29, ~~characterized in that the~~ wherein an index modulation is overmodulated to create a plurality of reflective bands.

32. A method according to ~~any one of~~ claims 1 ~~to 31~~, ~~characterized in that a~~ wherein the Bragg grating is ~~written~~ formed generating two reflective bands whose spectral spacing corresponds to an ~~the~~ offset produced by a force necessary for inverting the sign of the dispersion.

33. (currently amended) A filter, comprising: ~~obtained by using the method according to any one of claims 1 to 32~~

an optical waveguide having an exterior profile extending in a longitudinal direction and an interior profile extending in the longitudinal direction; and

a Bragg grating formed along the interior of the optical waveguide by varying the interior profile of the optical waveguide, independently controlling a variation of a Bragg wavelength along the longitudinal direction and independently controlling a variation of the exterior profile of the optical waveguide along the longitudinal direction.

34. (cancelled)

35. (currently amended) A filter according to claim 33~~4~~, ~~characterized in that~~ wherein the optical waveguide is

made in whole or in part by a melt-drawing process.

36. (currently amended) A filter according to claim 33 ~~or claim 35~~, ~~characterized in that it constitutes~~ wherein the Bragg grating comprises a reflective component.

37. (currently amended) A filter according to ~~any one of~~ claims 33~~ to 36~~, ~~characterized in that its~~ wherein the exterior profile is obtained by modifying the profile obtained after ~~the step of controlling the~~ varying the interior profile of the optical waveguide.

38. (currently amended) A filter according to ~~any one of~~ claims 33 ~~to 36~~, ~~characterized in that its~~ wherein exterior profile is obtained by controlling the variation of the ~~ying~~ interior profile of the waveguide.

39. (currently amended) A filter according to claim 37, ~~characterized in that~~ wherein the Bragg grating has a constant or linear period.

40. (currently amended) A filter according to claim 37 ~~or claim 38~~, ~~characterized in that~~ wherein the Bragg grating has a varying period.

41. (currently amended) A filter according to ~~any one of~~ claims 33~~ to 40~~, ~~characterized in that~~ wherein the longitudinal variation of the Bragg wavelength is linear.

42. (currently amended) A filter according to ~~any one of~~ claims 33 ~~to 41~~, ~~characterized in that it~~ wherein the Bragg grating comprises temperature control means.

43. (currently amended) A filter according to ~~any one of~~ claims 33~~ to 42~~, ~~characterized in that it comprises a deposit of~~ further comprising an electrically or thermally conductive material deposited in the Fiber

Bragg grating.~~, for example a metallic deposit.~~

44. (currently amended) A filter according to ~~any one of~~ claim~~s~~ 33~~ to 42~~, ~~characterized in that it is placed~~ wherein the filter is formed in a microfurnace.

45. (currently amended) A filter according to ~~any one of~~ claim~~s~~ 33~~ to 44~~, ~~characterized in that~~ wherein the optical waveguide is made from birefringent material.

46. (currently amended) A filter according to claim 45, ~~characterized in that~~ wherein the waveguide has a birefringence $\Delta n \geq 10^{-5}$.

47. (currently amended) A filter according to ~~any one of~~ claim~~s~~ 33 ~~to 46~~, ~~characterized in that~~ wherein the optical waveguide includes a core and an inner cladding and the photosensitivities of the core and the inner cladding of the waveguide are similar and the radius of the inner cladding is more than three times that of the core.

48. (currently amended) A filter according to ~~any one of~~ claim~~s~~ 33~~ to 47~~, ~~characterized in that~~ wherein the waveguide comprises a ~~is formed of an~~ stretched silica cladding fiber.

49. (currently amended) A filter according to ~~any one of~~ claim~~s~~ 33~~ to 48~~, ~~characterized in that it~~ further comprisinge~~es~~ applying a force application means based on one or more piezo-electric cells to form the Bragg grating.

50. (currently amended) A filter according to ~~any one of~~ claim~~s~~ 33~~ to 48~~, ~~characterized in that it comprises~~ wherein the force is applied by ~~application means based on~~ one or more step-up motors.

51. (currently amended) A filter according to ~~any one of~~ claims 49~~33 to 50~~, ~~characterized in that it comprises means for~~ measuring the optical properties of the waveguide ~~component~~ or the transmission quality ~~for applying~~ of the waveguide and using the measured optical properties or transmission quality to provide feedback to control the applied force.

52. (currently amended) A system comprising: ~~a filter according to any one of claims 33 to 51~~

an optical waveguide having an exterior profile extending in a longitudinal direction and an interior profile extending the longitudinal direction;

a Bragg grating formed along the interior of the optical waveguide by varying the interior profile of the optical waveguide, independently controlling a variation of a Bragg wavelength along the longitudinal direction and independently controlling a variation of the exterior profile of the optical waveguide along the longitudinal direction; and

means for applying a controlled mechanical force to the filter~~thereto~~.

52. (currently amended) A system according to claim 52, ~~characterized in that it~~ wherein the filter comprises a splitter ~~(100)~~ such as a three-port circulator associated with a filter for extracting an~~the~~ output signal.

54. (currently amended) A system according to claim 52, ~~characterized in that it~~ further comprising ~~comprises~~ a multiplexer-demultiplexer ~~(131)~~ associated with a plurality of the filters, each filter being operative to ~~for~~ independently filter~~ing independently~~ a plurality of channels or sub-bands.

55. (currently amended) A system according to claim 52,

~~characterized in that it~~ wherein the filter comprises at least two filters of which at least one is preferably tunable.

56. (currently amended) A system according to claim 55, ~~characterized in that it comprises~~ further comprising a four-port circulator with two intermediate ports respectively connected to the at least two ~~respective~~ filters ~~(F1, F2)~~.

57. (currently amended) A system according to claim 55, ~~characterized in that it comprises~~ further comprising two three-port circulators each having ~~with~~ intermediate ports respectively connected to the at least two ~~respective~~ filters ~~(F1, F2)~~, an output port and an input port, the output port of the first circulator being connected to the input of the second.

58. (currently amended) A system according to claim 52, ~~characterized in that it comprises~~ further comprising a plurality of filters in series.

59. (currently amended) A system according to ~~any one of~~ claim~~s~~ 52 ~~to 58~~, ~~characterized in that it comprises~~ further comprising means ~~(104, 106, 108)~~ for measuring optical properties ~~of the component~~ or a ~~the~~ transmission quality of the filter and for applying feedback to control formation of the filter based on the optical properties on the transmission quality ~~the force~~.